In re WILLIAMS ET AL., Application No. 10/051,728
Amendment B

Amendments to the Claims:

The listing of clams will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-11 (canceled)

Claim 12 (previously presented): A method for mapping packets to paths during a current forwarding cycle in a packet switching device, the method comprising:

generating a random index, the random index identifying a current particular path of a plurality of paths in the packet switching device;

for each particular packet of a plurality of packets stored in a recirculation buffer: in response to determining that said particular packet can be sent over the current particular path based on a path occupancy of the current particular path, causing said particular packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle; and

subsequent to the operation of said for each particular packet, while there remains at least one path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle and at least one more input packet: identifying a next input packet of said input packets; and if the next input packet can be sent over the current particular path as determined based on a path occupancy of the particular path, then causing said next input packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle if any such non-mapped paths remain, else moving said next input packet into the recirculation buffer.

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Claim 13 (previously presented): The method of claim 12, wherein said forwarding cycle corresponds to a packet time.

Claim 14 (canceled)

Claim 15 (previously presented): The method of claim 13, wherein the packet time corresponds to a round of sending one packet over each of the plurality of paths.

Claim 16 (original): The method of claim 12, wherein each of the plurality of paths corresponds to a different physical plane of a packet switching system.

Claim 17 (original): The method of claim 12, wherein the plurality of paths does not include all of the planes of a packet switching system.

Claim 18 (original): The method of claim 12, wherein the plurality of paths includes all of the planes of a packet switching system.

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Claim 19 (currently amended): One or more computer-readable media ~~containing~~ tangibly embodying computer-executable instructions for performing operations for mapping packets to paths during a current forwarding cycle in a packet switching device, said operations comprising:

generating a random index, the random index identifying a current particular path of a plurality of paths in the packet switching device;

for each particular packet of a plurality of packets stored in a recirculation buffer: in response to determining that said particular packet can be sent over the current particular path based on a path occupancy of the current particular path, causing said particular packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle; and

subsequent to the operation of said for each particular packet, while there remain at least one path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle and at least one more input packet: identifying a next input packet of said input packets; and if the next input packet can be sent over the current particular path as determined based on a path occupancy of the particular path, then causing said next input packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle if any such non-mapped paths remain, else moving said next input packet into the recirculation buffer.

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Claim 20 (previously presented): An apparatus for forwarding information over a plurality of paths, the apparatus comprising:

a recirculation buffer to store a first set of packets;

a random index generator to generate a random index;

an input to receive a second set of packets; and

control logic coupled to the recirculation buffer, the random index generator, the set of paths, and the input;

wherein the control logic is configured to attempt to forward packets over each of the plurality of paths each packet time from the first and second sets of packets with preference given to each packet in the first set of packets over each packet in the second set of packets, wherein a possible particular path for a particular packet is determined based on the random index and the number of packets previously assigned to one of the plurality of paths during the current packet time; and wherein a particular packet remains or is added to the recirculation buffer if it is not sent over its said possible particular path during the current packet time.

Claim 21 (previously presented): The apparatus of claim 20, wherein the particular packet is not sent during the current packet time if a destination of the particular packet is not reachable over its said possible particular path.

Claim 22 (previously presented): The apparatus of claim 21, comprising a storage mechanism, coupled to the control logic, including a data structure containing an indication of whether or not the destination is reachable over its said possible particular path.

Claims 23-30 (canceled)

Claim 31 (previously presented): The method of claim 12, wherein if said particular packet is not determined that it can be sent over the current particular path, said particular packet is moved to the end of the recirculation buffer.

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Claim 32 (previously presented): The computer-readable media of claim 19, wherein said operations include moving said particular packet to the end of the recirculation buffer if said particular packet is not determined that it can be sent over the current particular path.

Claim 33 (previously presented): An apparatus for mapping packets to paths during a current forwarding cycle in a packet switching device, the apparatus comprising:

means for generating a random index, the random index identifying a current particular path of a plurality of paths in the packet switching device;

means for processing each particular packet of a plurality of packets stored in a recirculation buffer, said processing including: in response to determining that said particular packet can be sent over the current particular path based on a path occupancy of the current particular path, causing said particular packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle; and

means for assigning packets to remaining unused paths subsequent to said processing each particular packet, said operation of assigning including: while there remains a path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle and at least one more input packet: (a) identifying a next input packet of said input packets; and (b) if the next input packet can be sent over the current particular path as determined based on a path occupancy of the particular path, then causing said next input packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle if any such non-mapped paths remain, else moving said next input packet into the recirculation buffer.

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Claim 34 (new): An apparatus for mapping packets to paths during a current forwarding cycle in a packet switching device, the apparatus comprising:

a plurality of paths;

a recirculation buffer; and

control logic configured;

wherein the control logic is configured to:

acquire a random index, the random index identifying a current particular path of the plurality of paths in the packet switching device;

for each particular packet of a plurality of packets stored in the recirculation buffer: in response to determining that said particular packet can be sent over the current particular path based on a path occupancy of the current particular path, causing said particular packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle; and

subsequent to the operation of said for each particular packet, while there remains at least one path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle and at least one more input packet: identifying a next input packet of said input packets; and if the next input packet can be sent over the current particular path as determined based on a path occupancy of the particular path, then causing said next input packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle if any such non-mapped paths remain, else moving said next input packet into the recirculation buffer.

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Claim 35 (new): The apparatus of claim 34, wherein said forwarding cycle corresponds to a packet time.

Claim 36 (new): The apparatus of claim 35, wherein the packet time corresponds to a round of sending one packet over each of the plurality of paths.

Claim 37 (new): The apparatus of claim 34, comprising a plurality of physical planes through the packet switching device; wherein each of the plurality of paths corresponds to a different physical plane of the plurality of physical planes.

Claim 38 (new): The apparatus of claim 34, comprising a plurality of physical planes through the packet switching device; wherein the plurality of paths does not include all of the planes of the plurality of physical planes.

Claim 39 (new): The apparatus of claim 34, comprising a plurality of physical planes through the packet switching device; wherein the plurality of paths includes all of the plurality of physical planes.

Claim 40 (new): The apparatus of claim 34, wherein if said particular packet is not determined that it can be sent over the current particular path, said particular packet is moved to the end of the recirculation buffer.

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Claim 41 (new): Logic encoded in one or more tangible media for execution and when executed operable for performing operations for mapping packets to paths during a current forwarding cycle in a packet switching device, said operations comprising:

generating a random index, the random index identifying a current particular path of a plurality of paths in the packet switching device;

for each particular packet of a plurality of packets stored in a recirculation buffer: in response to determining that said particular packet can be sent over the current particular path based on a path occupancy of the current particular path, causing said particular packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle; and

subsequent to the operation of said for each particular packet, while there remain at least one path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle and at least one more input packet: identifying a next input packet of said input packets; and if the next input packet can be sent over the current particular path as determined based on a path occupancy of the particular path, then causing said next input packet to be sent over the current particular path and advancing the current particular path to a next path of the plurality of paths not already mapped for forwarding a packet during the current forwarding cycle if any such non-mapped paths remain, else moving said next input packet into the recirculation buffer.

Claim 42 (new): The logic of claim 42, wherein said operations include moving said particular packet to the end of the recirculation buffer if said particular packet is not determined that it can be sent over the current particular path.

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